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Demonstrating the benefits of impact assessment for proponents

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ABSTRACT

This paper is a call for more studies that explicitly demonstrate the benefits of impact assessment to proponents. While the community of impact assessment practitioners generally believe that impact assessment is beneficial (to all stakeholders), empirical demonstration of this, particularly to project proponents, is warranted, and especially in financial terms. While many impact assessment benefits are intangible in nature, learning from the business and management literature shows how such benefits can usefully be measured based upon perceptions of managers within proponent agencies in tandem with archival material. A framework of the nature of impact assessment benefits for proponents, and their relative tangibility is presented along with a five step methodology for determining benefits. We now call upon impact assessment researchers and practitioners alike to use this framework and methodology to structure investigations from practice that will contribute to an empirical database for demonstrating the benefits of impact assessment to proponents.

Keywords: impact assessment benefits, proponents, cost-benefit analysis, effectiveness

1. Introduction

This paper is a call to practitioners and researchers alike to explicitly demonstrate the benefits of impact assessment for proponents in practice. And to do so in a simple but convincing manner. Our starting point and rationale are the concerns we have previously raised about the threat of cut-backs in impact assessment by governments around the world in the face of economic recession (Morrison-Saunders et al 2014), and our belief that: "impact assessment is faced with serious and potentially fatal threats to its existence from governments and others to whom impact assessment is nothing but an expensive and time-consuming regulatory hurdle" (Pope et al 2013, p7). While the community of impact assessment practitioners generally believe that impact assessment is beneficial, we have also previously noted that: "demonstrating the value of the benefits of IA [impact assessment] to all stakeholders has been an elusive quest for practitioners and researchers" (Bond et al 2014, p46). We argue here that in the face of the perceived threats to impact assessment that we see, it is imperative that more efforts are made to demonstrate its benefits. This paper seeks to contribute to future research in this area by offering a simple framework that can be used to structure such research, thereby enhancing comparability of studies and enabling a database of evidence to be built over time.

It has been previously pointed out by many authors, notably Bartlett and Kurian (1999), that impact assessment works in many different ways, and the influence of impact assessment therefore extends well beyond the management of actual impacts on the receiving environment. Whereas impact assessment follow-up, defined as "the monitoring and evaluation of the impacts of a project or plan (that has been subject to EIA [environmental impact assessment]) for management of, and communication about, the environmental performance of that project or plan" (Marshall et al 2005, p176), has been the subject of considerable research, the wider influence of impact assessment has received less attention. This can at least partly be attributed to the methodological challenges associated with evaluating the more intangible outcomes, especially as changes catalysed by impact assessment may only become apparent over time, such as learning within stakeholder organisations.

In seeking to redress this imbalance, we focus in this paper on one specific type of stakeholder organisation: the proponent. We have several reasons for doing so. Firstly, it is the actions of proponents that drive the need for impact assessment in the first place, so they are clearly a vital stakeholder; secondly, proponents are the main funders of impact assessment and hence have considerable influence over how it is conducted; and thirdly, in our experience it is often the proponent organisations leading the charge against impact assessment and pushing regulators towards ‘streamlining’ and ‘cutting green tape’ (e.g. Middle et al 2013; Morrison-Saunders et al 2014). For proponents, the credibility of impact assessment lies in its ability to offer benefits in excess of costs. In practice, as Fuller (1999) found, this translates into an expectation by proponents that impact assessment should deliver permission to develop at the least cost in the least time, approval to develop being a bankable benefit of impact assessment to proponents, as we shall discuss in more detail later. There may also be less obvious, less tangible benefits to proponents that emerge over time: for example Bartlett and Kurian (1999, p421) in discussion of their organisational politics model of impact assessment, suggest that “one possibility is that [impact assessment] may change the internal politics of an organisation required to undertake it” and it is conceivable that such changes might bring about longer-term benefits to the organisation. Thus, when we speak of benefits, we mean both the tangible and intangible benefits, and argue that it is essential to be able to identify and demonstrate all such benefits. In the absence of demonstration of benefits it is not surprising that some proponents see impact assessment as a regulatory burden rather than as a value-adding process, and may merely pay lip service to it, or even actively oppose it. We also acknowledge that the language of developers is money, and will consider the demonstration of benefits in financial, as well as qualitative terms.

The focus on proponents means that this paper and the framework it proposes are particularly aimed at forms of impact assessment in which the proponent is distinct from the regulator, which is typically true of project-level impact assessment. It may also be true of strategic environmental assessment (SEA) of policies, plans and programmes, but we recognise that in some systems the SEA is undertaken as part of developing the plan and hence the proponent and assessor can be one and the same entity. Proponents could come from the private or the public sectors, or a combination of both in the case of public-private partnerships. We consider that the need to demonstrate benefits is equally important for the private and public sectors alike.

We commence in Section 2 by critically reflecting upon work that has already been done in relation to demonstrating the benefits of impact assessment. Given the central role of proponents in this paper, we found it useful to draw upon models and wisdom derived in business and management literature to support the development of our framework. In particular we found a useful body of work relating to valuing the contribution of investments in information systems by individual companies. This literature has also grappled with the identification and measurement of benefits to endeavour to justify (or otherwise) the considerable resource implications of technological change. We reflect in Section 3 on some key learnings from this sector of relevance to the consideration of benefits within impact assessment. We use this literature as the basis for the development of a framework for categorising benefits in Section 4. It is important to emphasise at this point that our proposed framework merely offers a structure for future research; we do not pre-empt this research by specifying what all the potential benefits of impact assessment to proponents might be. In Section 5, we illustrate our framework with examples drawn from the published literature on impact assessment benefits to demonstrate its utility, but recognise the evidence of benefits is incomplete and call on researchers and practitioners to fill the gaps. Finally, we conclude with

a critical reflection on the framework proposed and present the broad outline of a methodological approach which can complement the framework as a means to focus research and learning in a traditionally rarely explored area of impact assessment.

2. Demonstrating the benefits of impact assessment – an overview of progress to date

It is not our intention to reproduce or attempt to summarise the scope of viewpoints and ways of framing or investigating the benefits of impact assessment in the previously published work here. We are supportive and appreciative of this important body of work. However, our sense is that, like Brown and McDonald (1995) essentially cautioned, studies of the benefits and effectiveness of impact assessment processes have remained largely as academic exercises carried out by researchers typically operating independently. We recognise that practitioners frequently report on successful impact assessment practice case studies at events such as the annual International Association for Impact Assessment (IAIA) conferences, but no sense of a united vision around the benefits of impact assessment has emerged to date. Oosterhuis (2007, p11) reported that he had: "not encountered any studies trying to estimate the environmental benefits of EIA in terms of the (quantified or even monetized) environmental improvement (or prevention of environmental damage) that can be attributed to the EIA procedure". In the face of the perceived threats to impact assessment we identified at the outset of this paper, we would like to see a more concerted effort, and especially targeted towards understanding impact assessment benefits for proponents. In saying this we acknowledge that we have an open ended understanding of the range of potential benefits and are reluctant to define benefits in any fixed way. This is different from the understanding of effectiveness which is specifically linked to a particular definition of the nature and purpose of impact assessment within different contexts, as pointed out by Elling (2009) and echoed by Morgan (2012).

In relation to our rationale for writing this paper, we also note that the messages around the benefits of impact assessment do not appear to be reaching all stakeholders. Upon reflection on the literature, we can identify several explanations for why this might be the case. We begin by reiterating two points made by Brown and McDonald (1995) that would appear to remain relevant today just as much as they did two decades ago. Firstly they stated that: 'Measuring the effectiveness and efficiency of EA are critical to assessing its achievements, but even after two decades of experience [i.e. now four decades], this is difficult because the necessary research has not been done' (p67). The implication here is that there is more discussion around how to determine impact assessment effectiveness in a theoretical sense, rather than empirical studies that apply the models that have been advanced. Secondly Brown and McDonald (1995) observed that extant effectiveness studies were generated from within the impact assessment community of practitioners, 'without the concomitant fundamental post-audit investigations required and input from other players' (p67). Whilst we are equally guilty of this limitation within this paper, our intention is to put forward a simple framework that will enable the benefits of impact assessment to proponents to be investigated and understood for refinement and advancement by all stakeholders. While there may be: "widespread consensus that EIA can contribute to significant environmental benefits" as Oosterhuis (2007, p11) claims based upon review of material generated by the impact assessment community, it is only if there is support for impact assessment across a broad section of society, and especially the proponents of development who are required to carry out impact assessment studies, that its future can be assured. Thus it is essential that the benefits to other stakeholders, and particularly to proponents, be investigated, evaluated and demonstrated; the framework we put forward points to a staged methodological approach for

doing this.

We are aware of some research recording proponent support for impact assessment. For example Annandale and Taplin (2003) reported that the majority of senior mining company executives from Australia and Canada in their study saw impact assessment as a "catalyst for integrating environmental design into the early planning of a project, thereby alleviating the need to spend money on overcoming environmental problems once a poorly designed project has been commissioned" (p383). Similarly a survey of proponents reported both direct and indirect effects of the federal environmental impact assessment regime in Australia to be an important driver of environmental benefits realised through the process (Macintosh, 2010). Anecdotally we have heard proponents to declare that obtaining an impact assessment approval is an important business outcome with respect to obtaining finance for new development ventures. This underscores the value presumably attributed to impact assessment by the major international financial institutions as evidenced by their establishment of their own voluntary Equator Principles, which require impact assessment to be undertaken should a recipient country for a funded development project not have an adequate system already in place (Macve and Chen, 2010). It also aligns with an identified benefit of impact assessment associated with the "legitimation of sound projects" (Ortolano and Shepherd, 1995, p9). The strongest advocacy we are aware of for the business benefits of impact assessment comes from Annandale and Taplin (2003) who reported that representatives from a significant majority of proponent companies in their survey: "indicated that the environmental approvals process should be considered to be an important determinant of investment strategy" (p392).

It is interesting to note that there seems to be a presumption in some circles that impact assessment is automatically assumed to be considered to be an overall cost burden to proponents rather than offering net benefit. Perhaps this is best illustrated in terminology employed in recent years describing impact assessment as 'green tape' (e.g. Middle et al 2013) or calling for 'streamlining' of processes because of perceived impediments to business (e.g. Morrison-Saunders et al 2014). Also of concern is an apparent bias in the framing of studies that do investigate the perceptions of proponents regarding impact assessment costs and benefits. For example, Annandale and Taplin (2004) drew attention to two industry studies within Australia from the early 1990s that: "were clearly designed with an underlying assumption that environmental approvals regulation is a cost burden" (p393) while Macintosh (2010) posed: "leading questions on cost-effectiveness" (p186) of impact assessment to proponents with several explicitly about aspects such as costs of referral, assessment, delay and compliance in relation to the federal Australian impact assessment regime, but no question was put to them specifically regarding benefits of the process. In this context, the conclusions of Annandale and Taplin (2004) outlined previously regarding overwhelming support by proponents for impact assessment are refreshing (and these authors very clearly expressed their methodology and sample size to demonstrate the robustness of their investigation). Naturally, we would like to see suitably neutral or well-balanced future research carried out in this area, and we re-broadcast the statement of Annandale and Taplin (2004, p395) that "it would appear relevant for further research to focus in more detail on why it was that companies viewed EIA as a 'benefit'".

As suggested above, some of the models for explaining how impact assessment works in practice (e.g. Bartlett and Kurian, 1999) or for determining effectiveness (e.g. Chanchitpricha and Bond, 2013), even simply lists of the benefits of impact assessment (e.g. McDonald and Brown, 1995; Ortolano and Shepherd, 1995; Oosterhuis, 2007) involve multiple topics or divisions of investigation, sometimes each containing further criteria or sub-topics to

consider. We speculate that perhaps the complexity of existing frameworks for determining the benefits of impact assessment inhibits uptake by researchers and practitioners.

We return to the subject of the demonstrated benefits of impact assessment in Section 5 where we use examples from the literature to populate and hence demonstrate the use of our framework.

3. Frameworks for determining benefits

To clarify our thinking on how best to synthesise notions of the benefits of impact assessment into a simple framework that is cognitively manageable, we found it useful to turn to the business and management literature. Experience has been gained in this field around how to account for intangible as well as tangible benefits, in this instance for companies investing in new information systems infrastructure. In the business and management literature there is significant focus on tangible versus intangible benefits with a recognition that both need to be measured to fully account for the benefits of system development. Remenyi (et al, 2007) employs the following definitions:

"a tangible benefit is one that directly affects the organization's bottom line [i.e. profitability] and an intangible benefit does not. An intangible benefit has an indirect impact on the organization's productivity and performance" (Remenyi et al, 2007, p28).

In a similar vein, Irani and Love (2001) developed a taxonomy for classifying benefits based on Financial, Non-Financial and Partly/Totally Intangible benefits, and throughout their paper they employ the expression "intangible and nonfinancial benefits and costs". As might be expected, all of these authors we have cited report that intangible benefits are difficult to measure. Murphy and Simon (2002) cite a similar view from an earlier study by Hares & Royle (1994), noting that these authors also argued that the boundary between tangible and intangible benefits is a fuzzy one. This resonates with impact assessment in that the tangible costs are easy to assess, whereas many benefits are largely intangible. In the business and management literature, Lev and Zarowin (1999) note that changes in firms, in this case the investment in information systems: "are immediately expensed, while benefits of change are recorded later and are not matched with the previously expensed investments" (pp353-354). This means that: "the fundamental accounting measurement process of periodically matching costs with revenues is seriously distorted, adversely affecting the informativeness of financial information" (Lev and Zarowin (1999, p354). By extrapolation it is clear that the same challenge is faced when trying to determine the benefits of impact assessment for proponents. It is easy enough to quantify and account for the financial costs of doing impact assessment (e.g. such as in the work of Retief and Chabalala 2009 and Macintosh, 2010), but less clear whether the benefits of doing impact assessment will ever be presented in the same terms.

The matter of quantification of intangible benefits receives considerable attention in the business and management literature, for example, as reviewed by Murphy and Simon (2002). They draw upon the work of Litecky (1981) who proposed two assumptions as a precondition to quantifying benefits as follows:

First, both tangible costs and benefits are relatively easy to estimate, whereas intangible benefits are quite difficult to estimate. Secondly, tangible costs are ordinarily much greater than tangible benefits, and intangible costs are often insignificant (Murphy and Simon, 2002, p305).

If these assumptions are applied to impact assessment, the inference for a proponent is that the known costs of conducting impact assessment are higher than the known benefits. Any

unknown costs are likely to be negligible in comparison to the known costs. Unknown benefits remain unknown – which is the basis for the current concern over the cost effectiveness of impact assessment which forms the problem statement for this paper.

A similar view has been expressed by Oosterhuis (2007) in relation to uncertainty around determining the net benefits of impact assessment, who wrote: "you can be sure that there will be costs if an EIA is done, but you are not sure that there will be any benefits in terms of better decision making" (p14). Likewise many stated benefits of impact assessment, such as the notion of enhanced proponent reputation or environmental profile (Oosterhuis, 2007; McDonald and Brown, 1995) are intangible and likely to be impossible to quantify and potentially insignificant relative to the actual financial costs of conducting impact assessment. This is notwithstanding the widely held position that the cost of an impact assessment is minimal compared to total project cost. Oosterhuis (2007) found that EIA cost amounts to approximately 1% of the overall development cost (e.g. a review of more than a dozen studies by Oosterhuis 2007 establishes this) while Retief and Chabalala (2009) found this figure to fluctuate between 0.01% and 3.9% of total project cost for the nine countries included in their study. The point here is that attributing cause and effect, along with quantification of financial benefit and in the context of an uncertain time-frame (e.g. costs incurred for conducting impact assessment might fall into a one or two year time period, but ongoing proponent reputation benefit is open-ended) is challenging. Nevertheless, to demonstrate impact assessment benefit is going to require grappling with attribution of benefits and the matter of quantification.

So far we have not explained the nature of intangible benefits identified within the business and management literature. We found insights and framing from this literature to be helpful in providing a conceptualisation that classifies benefits as a first step towards their evaluation. We explore these in more detail in the next section, culminating in our own classification for impact assessment benefits.

4. Classifying benefits

The business and management literature we reviewed for this paper provides some conceptual models for classifying and understanding the benefits to companies around information systems investment decisions. Common elements in all classifications are tangible versus intangible benefits, so we have included this important distinction in our framework (Table 1). The methodology employed by Murphy and Simon (2002; which was adapted from earlier work by Shang and Seddon (2002) for accounting for information systems benefits for business included four dimensions or themes that we see as being valid in an impact assessment context for proponents as follows (we excluded the 'IT [information technology] infrastructure' theme for obvious reasons):

- *operational* benefits – cost reduction, time reduction, productivity improvement, quality improvement, and customer services improvement;
- *managerial* benefits – better resource management, improved decision-making and planning, and performance improvement;
- *strategic* benefits – support business growth, support business alliance, build business innovations, build cost leadership, generate product differentiation, and build external linkages; and
- *organizational* benefits - support organisational changes, facilitate business learning, empowerment, and build common visions.

Irani and Love (2000) employed a taxonomy based around strategic, tactical and operational classifications (drawn from earlier work of Harris 1996) and noted that strategic benefits are generally intangible and non-financial in nature while operational benefits are more likely to be tangible, even though often also non-financial in nature. There is a clear resonance here with thinking about the nature of strategic forms of impact assessment (e.g. Noble 2000) tending to be more broad-brush and less specific in nature relative to project level approaches. Like the Murphy and Simon (2002) example previously, Irani and Love (2000) outlined multiple sub-points for each of their three classifications. We found a close match in the descriptions for strategic and operational benefits between these two studies, while their 'tactical' classification was suitably encapsulated in the managerial and organisational benefit categories of Murphy and Simon (2002). Table 1 sets out a basic framework for classifying the benefits of impact assessment on this basis.

Table 1 Benefits classification system

Benefit Dimensions	Tangible	Intangible
<i>Operational</i>		
<i>Managerial</i>		
<i>Strategic</i>		
<i>Organizational</i>		

In the next section we introduce what is already known about the benefits of impact assessment drawn from the literature. This provides an early opportunity to examine the gaps in our knowledge of benefits based on the classification system outlined in Table 1, and also to clarify the gaps which can form the basis for future research. We acknowledge that other evidence of benefits could have been missed from the literature review, and encourage others to remedy any such deficiencies where possible.

5. Benefits of impact assessment in the literature

This section introduces the learning from the extensive body of impact assessment literature and attempts to place it in the framework set out in Table 1. In the literature there are various streams or themes of work that relate to demonstrating the benefits, often implicitly, sometimes explicitly. Firstly there are works addressing the expressed purpose or principles of best practice impact assessment such those as laid out by the International Association for Impact Assessment (IAIA and IEM 1999); these purposes are by definition benefits of some kind, although they are often intangible goals like *sustainable development* (Bond and Morrison-Saunders, 2011) which are difficult to achieve. This tallies with the recently emerged thinking around sustainability assessment - especially the work of Robert Gibson calling for impact assessment to be expressly framed to deliver positive contribution to sustainability through mutual reinforcing gains across all sustainability considerations (e.g. Gibson 2006, 2011, 2013) rather than emphasising only mitigation of adverse impacts. Researchers have grappled with these 'substantive purposes' of impact assessment (Cashmore et al, 2004; Cooper and Canter, 1997; Rozema et al, 2012; van Doren et al, 2013) and acknowledge their contested nature. We note that impact assessment legislation would normally outline the objectives of that particular process within that specific institutional context.

Secondly, there is the seemingly 'interminable' (Cashmore et al 2004) and contested literature on impact assessment effectiveness. Some recent reviews of this material can be found in Chanchitpricha and Bond (2013) and Bond et al (2013) along with criteria grouped according

to different conceptions of effectiveness that the authors intend might guide evaluation of impact assessment processes or applications to measure impact assessment effectiveness. Some of these criteria are phrased in terms of the benefits that should accrue from impact assessment, for example Chanchitpricha and Bond (2013, p.70) have an effectiveness criterion: “*Institutional and other benefits* — there is strong evidence of better departmental relations, development of otherwise absent expertise, learning, new partnerships and better public–private–voluntary sector communication as a result of SEA/IA when it is implemented in decision making” where benefits are clear; another one is: “*Parallel development* — the SEA/IA and policy/plan/programme developed alongside one other with considerable cross-cutting between the processes” where benefits do not necessarily accrue other than in efficiency terms relative to another way of undertaking the assessment. From a proponent perspective there are benefits to be realized in these notions of impact assessment effectiveness and they are clearly intangible in nature.

Finally, there is the matter of the nature and clarity of impact assessment benefits themselves. Key intended benefits of impact assessment revolve around mitigating adverse effects through designing better development proposals and making better decisions. The notion of better decision-making at the individual proposal level can equally apply to proponents in terms of positive actions such as withdrawal of unsound projects, selection of improved project location, or reformulation of plans (Ortolano and Shepherd, 1995); as well as to government approval decisions, including legitimization of sound development proposals (Ortolano and Shepherd, 1995), setting conditions to provide for appropriate mitigation and management measures, and rejecting proposals demonstrated to be environmentally or socially unacceptable.

Some of the intangible benefits of impact assessment identified in the literature include:

- *involving new and beneficial stakeholders* in the planning and design process for development proposals leading not only to improved decisions but also to reformed public decision-making processes including 'enhanced inter-agency coordination' (Ortolano and Shepherd, 1995, p11), better cooperation among the concerned authorities and the proponent (Oosterhuis, 2007), and changes to power relations between ministries (Ortolano and Shepherd, 1995);
- *increased public involvement and participation* (Oosterhuis, 2007);
- *encouraging the development of enhanced predictive and evaluative models* (McDonald and Brown, 1995);
- *improvements in the environmental profile of proponents* (Oosterhuis, 2007) and 'greening of the boardroom' (McDonald and Brown, 1995, p485) whereby fewer environmentally unsound proposals are initially put forward and there may be redefinition of the goals and responsibilities of proponents (as well as government and professional organisations also involved in impact assessment) arising in the face of the need to conduct impact assessment;
- *higher acceptance of proposed development proposals and fewer conflicts* (Oosterhuis, 2007);
- *time savings* (Oosterhuis, 2007);
- *prevention of costs*, including avoiding unnecessary impact assessments where good project design occurs in concert with effective screening and scoping mechanisms (Oosterhuis, 2007); and
- *stimulating environmental education* within impact assessment stakeholders more generally. [Western Australia is one jurisdiction we are aware of that explicitly identifies the promotion of 'education and awareness in environmental issues'

(Western Australian Government Gazette 2012, s3(6) as a stated aim of environmental impact assessment].

Table 2 integrates the current known benefits of impact assessment with the benefits classification system from the business and management literature presented in Table 1.

In terms of actually demonstrating the benefits of impact assessment, we note that it is challenging enough to demonstrate the explicitly stated objectives of impact assessment, simply because while monitoring following implementation of development that has undergone impact assessment might measure the environmental and social outcomes attained, there is no available benchmark for the same development without impact assessment. Meanwhile, the intangible benefits attributed to impact assessment above are more difficult to ascertain in the first instance and there is a further challenge in being able to attribute these benefits to the presence of impact assessment, rather than some other influence within a given society. In other words, at the heart of demonstrating the benefits of impact assessment lies the challenge of demonstrating cause and effect. This challenge has spurred its own research field examining counterfactuals (for example, Barker, 1999; Hillier, 2003; Lenihan and Hart, 2004). Finding a way to account for tangible and intangible benefits of impact assessment is central to our framework as addressed in the next section.

Table 2 Current known benefits of impact assessment

Benefit Dimensions	Tangible	Intangible
<i>Operational</i>	<ul style="list-style-type: none"> • prevention of costs • time savings 	<ul style="list-style-type: none"> • higher acceptance of proposed development proposals and fewer conflicts • delivery of sustainable development
<i>Managerial</i>		<ul style="list-style-type: none"> • involving new and beneficial stakeholders
<i>Strategic</i>		<ul style="list-style-type: none"> • stimulating environmental education • improvements in the environmental profile of proponents • encouraging the development of enhanced predictive and evaluative models
<i>Organizational</i>		<ul style="list-style-type: none"> • Institutional and other benefits

6. Discussion and Conclusions

So far we have classified benefits drawing on the business and management literature and have made initial attempts to classify the benefits already assessed in the impact assessment literature. There are gaps, largely related to tangible benefits where it may be that some obvious and measurable benefits are not being investigated. Table 2 is also striking in terms of the large number of intangible benefits which we can see, but can't currently measure. However, the business and management literature provides some methods for measuring the intangible benefits.

Tallon (et al 2000) used executives' perceptions as proxy measures for payoffs relating to information systems investment by companies, based on an assumption that perceptual measures of firm performance correlate strongly with more traditional objective measures; as has been demonstrated in earlier studies (e.g. Boyd et al, 1993; Starbuck and Mezias, 1996). The impact assessment studies of Macintosh (2010) and Annandale and Taplin (2003) were

founded on surveys or interviews with proponents. In subsequent work, firstly Annandale et al (2004) used the perceptions of managers of companies as a basis for determining the performance outcomes of voluntary environmental protection instruments (specifically corporate environmental reporting and environmental management systems), and secondly Annandale et al (2007) performed a follow-up analysis of the same companies using printed documents and other archival material. In doing so, they verified the earlier findings in the business and management literature that perceptual measures of company executives are an accurate source of performance related information. The methods employed by Annandale et al (2004) and Annandale (2007) could be applied to impact assessment as a means of documenting benefits as perceived by proponents (and also other stakeholders in the process) but the issue of quantification still remains.

Murphy and Simon (2002) noted in their review that for businesses investing in information services, many such projects deliver benefits that cannot easily be quantified. Remenyi (et al, 2007) make the same point stating that: "Intangibles are, almost by definition, hard to measure" (p109), although they remain convinced that: "intangible benefits can make a critical contribution to the success of an organisation" (p29). Similarly, while the majority of sources identified by Oosterhuis (2007) pointed towards net benefits of impact assessment, such conclusions were "usually based on a qualitative assessment rather than on a formal analysis of costs and benefits" (p19).

On the basis that companies are motivated in the main by financial performance, it would be desirable to quantify benefits and express them in financial terms so that they can be truly realised alongside the costs. Here methodological considerations for determining and assessing benefits become paramount. Remenyi (et al, 2007) noted that:

Intangible benefits may often be quantified by using measuring instruments such as questionnaires, but it is quite difficult to make a creditable connection between what can be measured with such devices and the impact on the corporate financial results. This whole area of intangible benefits is one of the major problems that make benefit measurement and management hard (Remenyi et al, 2007, p29).

Despite these inherent challenges, Remenyi (et al, 2007) outline a methodology for helping to assess benefits of information systems investments for business planning purposes. We have cast this methodology into the context of impact assessment by a proponent, and with the intention of such an investigation being carried out as a post-audit or follow-up to impact assessment, as follows:

- Step 1 – conceptualize the chain of cause-and-effect benefits arising from engagement in impact assessment (i.e. during design, pre-approval decision assessment activity and implementation of development). [Note: this step could either map out *all* impact assessment benefits, or focus solely on benefits specifically for proponents];
- Step 2 – Identify how it will be possible to establish the changes likely to occur as a result of application of impact assessment to a given development scenario, with a focus on the direction of the changes (e.g. will the change represent a cost or benefit to the proponent?);
- Step 3 – Consider how the size of the change may be measured;
- Step 4 – Measure the size of the change (i.e. through a combination of perceptual and archival sources); and
- Step 5 – Put a financial value on the changes that have been observed.

This five step approach could also be applied to other stakeholders in impact assessment, such as regulators or community groups, taking into account that different purposes or outcomes of impact assessment may become the focus as well as different ways of measuring their value. Following the examples of Tallon (et al 2000) and Annandale (et al 2004)

previously, Step 4 will require researchers to engage with proponent managers and documentation in the main along with other relevant stakeholders to determine the extent of impact assessment benefits. Regarding Step 5, there are numerous well established techniques already existing within the cost-benefit analysis literature for putting financial values on natural and social phenomena that impact assessment researchers and practitioners have utilised (e.g. Ziller and Phibbs, 2003; Vaughan et al, 2000; Hardisty, 2010; Vega and Alpízar, 2011).

In conclusion, our agenda in this paper is to call for more studies that explicitly demonstrate the benefits of impact assessment to proponents. We have shown that while the community of impact assessment practitioners generally believe that impact assessment is beneficial (to all stakeholders), this message has not often been empirically demonstrated and nor is it obvious to those outside of the impact assessment community. While many of the benefits of impact assessment are intangible, learning from the business and management literature suggests that they can usefully be measured. We have presented a five step methodology for accomplishing this based upon perceptions of managers within proponent agencies in tandem with archival material. Further we have articulated the nature of impact assessment benefits, and their relative tangibility in a simple framework. We now call upon impact assessment researchers and practitioners alike to pursue investigations from practice that will build an empirical database on the small body of existing foundational work, especially that of Annandale and Taplin (2003), for demonstrating the benefits of impact assessment to proponents.

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